Technology in Teacher Education: Faculty Visions and Decision Making

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Setting the Stage

Thorstein Velben, noted U.S. economist and social philosopher, stated, "The outcome of any serious research can only be to make two questions grow where only one grew before." This was the situation with a study conducted at the University of Florida. During the 2002-2003 academic year, preservice teachers enrolled in a senior level technology integration course in the teacher education program (EME 4406) had the opportunity to participate in a survey study regarding perceptions of their abilities and intent to use technology in teaching and learning environments. As part of the demographic data collected in that study, preservice teachers were asked to provide their perceptions of the amount of time teacher education faculty used a computer for teaching and learning related purposes. According to the survey data at the beginning of the semester, 95% of the preservice teachers perceived teacher education faculty use a computer 3 hours or less a week. At the conclusion of the semester, 75% of preservice teachers perceived teacher education faculty computer use to be 3 hours or less a week. Acknowledging that students frequently have an unrealistic view of the job of teacher education faculty, it was still an interesting finding. Preservice teachers' experiences in the teacher education program obviously influenced this perception. What kind of modeling of technology in the teaching process occurs in teacher education classrooms? Where are preservice teachers seeing technology used in meaningful ways? Who uses technology as a way to teach his or her classes?

"Some do, some don't." That statement could summarize the integration of technology into the teacher education curricula by faculty members at the University of Florida (UF). Yet, why is this the case? What factors influence a teacher educator's decisions to use or not use technology in his or her courses? Do teacher educators at UF have a common vision for what the term "integrating technology into the teacher education program" means? In an effort to investigate these questions, a two-fold descriptive exploratory case study was designed to 1) investigate faculty decisions regarding the use of technology in his or her courses and 2) determine what the phrase "integrating technology into the teacher education program" means to faculty by producing foundational work for an innovation configuration map (Hall, Wallace, & Dossett, 1973) regarding the infusion of technology into the teacher education program.

Theoretical Framework

This study was framed within an interpretive perspective because of the intent to understand faculty members' meaning behind the phrase "integrating technology into the teacher education program", their perceptions of what the integration of technology into the teacher education

program would look like, and what factors influenced their decision to use or not use technology in their courses. Specifically, this study was a descriptive exploratory case study because an in-depth study of the situation within a bounded place and period of time is used to determine what is occurring. Merriam (2001) states for a case study "the interest is in process rather than outcomes, in context rather than a specific variable, in discovery rather than confirmation." (p. 19)

Guidance from Literature

Two major areas of research and literature informed the work in this study. The first area was change theory literature. This body of work provided guidance in understanding how an innovation, in this case the integration of technology into a teacher education program, is accepted into the culture of a faculty and the teacher education program. Specific change models that guided this study were Rogers' (1995) *Diffusion of Innovations*, Ely's (1976) *Conditions for Change*, Hall, Wallace, and Dossett's (1973) *Concerns-based Adoption Model* (CBAM), and Zaltman and Duncan's (1977) work on resistance factors. The second area of research and literature grounding work in this study was faculty decision-making literature. This literature provided a framework for soliciting information during faculty interviews. Findings and recommendations from the works of Borko and Shavelson (1990) and Borko, Livingston, and Shavelson (1990) guided the development of interview questions. Connections to specific areas of the literature will be intertwined in the research findings and implications.

Study Procedure

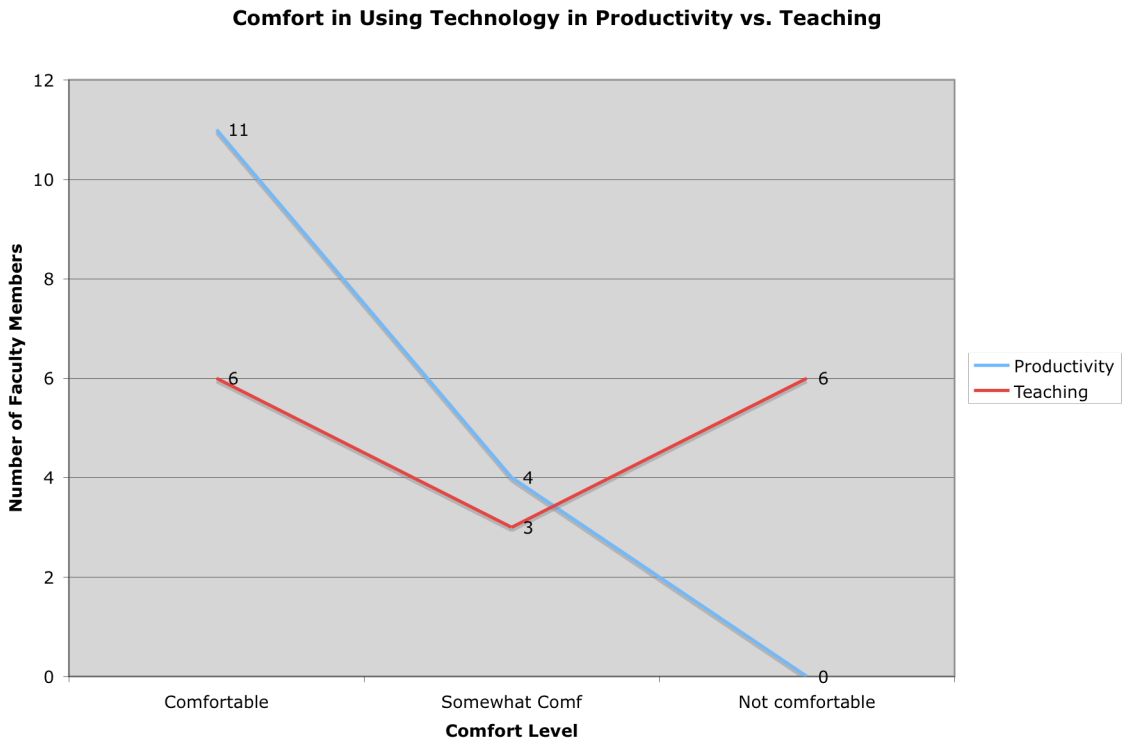
During the fall 2004 academic term, fifteen teacher education faculty members from the School of Teaching and Learning agreed to be interviewed twice during the semester forming a typical sample of teacher educators at the University of Florida (Patton, 1990). Interviews took place from August 30, 2004 to October 26, 2004. Upon completion of the interviews, the tapes were transcribed and data analysis began. Pattern coding was the first method of coding that took place. Following pattern coding, category construction took place (Taylor & Bogdan, 1984). This strategy allowed the researcher to fully address the study research questions. Subsequent discussions with some participants took place in order for the researcher to more fully understand participants' perspectives. Member checks took place by providing draft documents to all participants and allowing them to make corrections, clarifications, and provide general feedback.

The Teacher Education Faculty

Fifteen of the 28 faculty members from the School of Teaching & Learning participated in this study. The principal investigator applied for and received IRB approval prior to seeking volunteers and estimated that no more than 50% of the school would volunteer to be interviewed so 15 was listed as the maximum number of participants in the protocol. More than 15 faculty volunteered to be interviewed so the first fifteen that volunteered were selected for the study. The number of faculty that volunteered to participate in this study indicates faculty in the School of Teaching & Learning consider the use of technology in teacher education worthy of discussion.

The fifteen teacher educators who participated in the study represented a cross-section of the department in terms of program area, years of experience, tenured vs. tenure accruing, and expertise with computers. In this study, faculty members with full-time administrative, part-time administrative, and full-time teaching responsibilities represented part of the study sample. Nine of the fifteen faculty had tenure. The average years experience as a faculty member in higher education was 16 years with a median of 14 years. The range of experience was four to thirty-three years. Faculty were also asked to rank their experience with computers. Four participants rated themselves as beginners, six as intermediate users, two as advanced beginners (a category created by the participants), and three as advanced. Comfort levels in using the computer for productivity and teaching was also self-assessed. In terms of using the computer for productivity purposes (i.e.: email, word processing, etc.), eleven of the participants felt comfortable with technology and four participants felt somewhat comfortable. However, in terms of using technology in their teaching, six participants were comfortable, three were somewhat comfortable, and six were uncomfortable. Graph 1 illustrates the data regarding comfort using technology.

Graph 1: Comfort with Technology in Productivity vs. Teaching



Results

Findings from this study will be focused in three general categories: factors that influence teacher education faculty members' decisions regarding the use of technology in their course, barriers to using technology in teacher education courses, and the start of an innovation

configuration map to illustrate what a common vision for technology integration might be within the teacher education program at the University of Florida.

Factors that Influence Teacher Educators' Decisions Regarding The Use of Technology

General faculty resistance to technology is often stated as a reason why technology is not integrated into curriculum. However, this study and other research indicate that viewpoint is too simplistic to accommodate the complexities associated with teaching. In this study, interview responses indicated teacher educators are willing to consider the integration of technology into their courses if the integration satisfies their conditions and concerns. This corresponds with literature on factors that influence teachers' instructional planning (Borko, Livingston, & Shavelson, 1990; Borko & Shavelson, 1990). Categories shown to affect teachers' decisions are teacher beliefs (Borko, 1978; Borko & Niles, 1982), the context of instruction (McCutcheon, 1980; Borko, Eisenhart, Kello, & Vandett, 1984; McNeil, 1982), the nature of the instructional task (Shavelson & Stern, 1981; Clark, 1978-1979; Smith & Sendelbach, 1979), and information about students (Mintz, 1979; Morine-Dershimer, 1979; Shavelson & Stern, 1981).

Interview responses indicated the teacher educators in this study have to some degree made sense of how technology meshes with their beliefs and the content and context of their courses. All participants in this study were asked to state the goals for the preservice teachers in their teacher education courses. In each interview, it became apparent the teacher educator weighed the use of technology and the perceived value added to their courses as a part of those goals.

> I believe teaching is a relationship business first and foremost and at its best. Therefore, teacher education also needs to be a relationship business. I believe in modeling in my classes what I hope teachers would employ in theirs. Hence, my approach is to make this big class seem smaller…If there are ways technology could make this big class feel smaller, then it would be helpful. (Participant 13)

Technology clearly meshed with an educator's beliefs about the use of technology in her methods course and what preservice teachers specifically needed to experience.

> It is almost impossible to imagine students in college and secondary not using the computer for the production of text. We have word processors, electronic readers—all kinds of things people use on a daily basis in their jobs at all social strata to create text—PowerPoint presentations, family scrapbooks, letters, novels, books, poems—all of those kinds of things. So to do nothing with technology ignores how people in the 21st century and even the latter part of the 20th century make text. That would be unforgivable in English Education. (Participant 12)

Another factor that influenced teacher educators' decisions to use technology revolved around the context of the instruction. Faculty carefully weighed how the use of technology might mesh with the experiences preservice teachers needed during that course and as he or she developed as a teacher.

> Because I think of technology as a tool to enhance learning, technology allows us to create context for students. Using tools that are thinking tools allows teachers to examine their beliefs, articulate new beliefs, creating new knowledge to add to their teaching toolbox. (Participant 8)

Teacher education faculty were also careful to consider how technology could benefit the teaching of specific concepts. This quote shows how faculty carefully considered use or non-use of technology in their courses.

> I can't really describe how technology should be integrated into courses or lessons without first addressing the question what am I trying to accomplish with this lesson or course?...I use audiovisual materials (videos, DVDs, etc.) to help students better understand the classroom environment. (Participant 7)

As noted above, teacher educators expressed factors for using or not using technology in their teaching in terms of beliefs, the needs of students, the context of the instruction, and the nature of the instructional task. However, these factors revolving around curriculum planning were not teacher educators' only concerns when deciding to use technology in their courses. There were other barriers associated with the use or non-use of technology in courses provided by faculty that mesh with findings from change theory.

Barriers to Using Technology in Teacher Education Courses

In their book *Strategies for Planned Change*, Zaltman and Duncan (1977) write of resistance in four categories: cultural, organizational, psychological, and social. During these interviews, faculty articulated barriers to using technology in their teacher education courses from each of these categories.

Zaltman and Duncan describe cultural barriers as those rooted in traditions and values of the system. Tenure-track teacher educators discussed the time involved in learning technology and then in implementing technology into their classes as not complimenting their pursuit of tenure and promotion. Faculty found students often reacted poorly to new techniques and this showed in faculty evaluations. Non-tenured faculty view this as a very serious matter because teacher evaluations are part of the tenure and promotion packet. In addition, the time spent learning and working to implement technology into the curriculum is considerable. "I could have written at least two articles on the time I spent on creating those CDs for that class." (Participant 12) These insights show Rogers' (1995) attributes of relative advantage and compatibility along with Ely's (1976) condition of receiving rewards or incentives for participants are not being met for faculty. When tenure and promotion systems do not reward faculty for being innovative in their teaching, it will be difficult and possibly risky for tenure-accruing faculty to justify the time and effort for using technology in their teaching.

A related category is that of organizational barriers. These are characteristics of the system that conflict with the demands of change invoked by the innovation. This category is where a majority of the barriers provided by the teacher educators reside. Many of these organizational issues dealt with different issues associated with time. Numerous faculty addressed the issue of

how much time technology takes in the classroom and the limited amount of contact time with students.

> I don't have the time to figure out all these kinks in Vista [WebCT program]. So, I must assume that students will need assistance to access and use Vista. I would feel so disingenuous to tell students the reading is online at Vista—go figure out how to get it. I hate not providing scaffolding. There just isn't the time to teach the content and the technology. (Participant 9)

Another faculty stated, "Technology also takes more time and you have to figure out whether the pay off is worth it. If the technology gets in the way, it should not be used." (Participant 8) These quotes represents many of the faculty's situational viewpoints about the learning curve associated with using technology in the teaching environment and the need to evaluate whether the time is well-spent. The quotes show the lack of consideration for Ely's (1976) conditions of time to learn, adapt, integrate, and reflect on what is happening; that implementers need to have sufficient knowledge and skills to perform the work, and that the use of the innovation should be better than the status quo.

A closely related organizational barrier is one of faculty development. Although many faculty spoke highly of the people that provide training, overall the training is seen as inconsistent and inadequate. The College training was noted for providing good "familiarizing" experiences but that those experiences would not result in changes in teaching. This again shows Ely's (1976) conditions of time to learn and providing implementers with meaningful experiences to gain knowledge and skill in using the innovation are not being adequately met.

> The training we've received is inadequate, infrequent, and unsuccessful. It hasn't moved me to a next point and to use it in a way that is productive or effective. The training is not responsive to the conditions in my classroom. One-trial learning is notoriously inefficient. (Participant 13)

The classroom environment was another factor frequently mentioned in using, or not using, technology in courses. This is a classic example of Zaltman and Duncan's factor of organizational resistance to change. Although the University is making significant investments in trying to update and equip university classrooms with technology, it is still difficult for faculty to use. "Using technology in our current classrooms is a hindrance." (Participant 4) Another faculty noted,

> I feel frustrated overall in trying to use technology in my teaching. The media center is pretty good—the drop off and leave. The rooms really are not equipped very well. It is easier for me to go home and print out my PowerPoint slides for the discussion prompts than to bring in my laptop and make that work. I want to do something more dynamic and interesting but the classrooms don't facilitate this…I would love to plan a lesson and know that this technology is going to be in the classroom and working for me. Otherwise, I'll default back to transparencies. (Participant 9)

A final organizational barrier faculty addressed was the disconnect between the use of technology in the schools and the way that technology is presented in some teacher education courses. "In a county like this one, an intern may be able to get students into a computer lab once or twice a semester—it isn't something that can be a daily task." (Participant 12) Yet, this disconnect is not seen as detrimental by faculty.

> I don't think our preservice teachers are seeing the technology we model to them in their multiple field placements. We must help these students work in the context they will be in but also work in the context they will create. (Participant 8)

Zaltman and Duncan state there are also psychological barriers that exist solely within the individual. They list perception, homeostasis, conforming and commitment, and personal factors as examples of psychological barriers. Faculty examples of barriers in this category clearly show Rogers' (1995) attribute of relative advantage has not been demonstrated to faculty.

> I'm not being a stubborn child but I look at the fact I only have so much time. I feel my teaching is very effective and I get that kind of feedback from my teaching consistently and I haven't seen how jumping into a lot of technology workshops would make the work I do more efficient. Technology for technology's sake makes no sense to me. Now I do recognize that by doing this, I'm not aware of instructional possibilities. I may be short-changing my students because I'm not aware of things that exist and that bothers me sometimes. (Participant 7)

> I don't want to drop off the edge of the instructional earth but the combination of inadequate uses of technology to the point of where what I care about most—relationships—are comprised and even downplayed lead me to where I am. (Participant 13)

Zaltman and Duncan's final category of barriers, social resistance, is mentioned by faculty but mostly about students in the program. Faculty did note that some faculty were more acknowledged for their use of technology. "We have people like [name omitted] getting accolades for using technology in the classroom but most of us don't even know what that means or looks like." (Participant 9) Yet most of the social resistance faculty addressed was on the student side. A faculty member noted

> How do students really feel about computers? Is there a gender issue that corresponds to these attitudes? The students that struggle in EME 4406 in our program are always women and they are always older. Preservice teachers are not going to elect technology if they don't feel comfortable. (Participant 12)

In conclusion, the barriers described by faculty give some insight into how this specific institution could increase the use of technology in the teacher education program. Factors such as ease of access, meaningful professional development, and providing schools with common technology could change the look of technology integration at UF. Other factors deal more with the teacher educator's situational viewpoints and beliefs about the appropriateness of technology

in his or her courses and that is a more difficult challenge to address. Nevertheless, all faculty members had reasonable justifications of what the phrase "integrating technology into the teacher education program" means.

Developing an Innovation Configuration Map

When innovations are introduced into an organization, the implementation of the innovation is often drastically different for each stakeholder. "This is particularly problematic when what is being done under the name of the innovation is different in different classrooms." (Hall & Hord, 2001, p. 36). In order to address the differences in understandings for an innovation and determining how to move toward meaningful change with the innovation, Hall and associates developed the third component of the *Concerns-based Adoption Model*—the innovation configuration (IC) map. "The focus in the IC diagnostic dimension is on developing and applying word-picture descriptions of what the use of an innovation can look like." (p.38) The purpose of an innovation configuration map is to develop descriptions of different ways the innovation could be implemented within the educational institution. "Three key questions that should be asked throughout the process are: 1) What does the innovation look like when it is in use?, 2) What would I see in classrooms where it is used well (and not as well)?, and 3) What will teachers and students be doing when the innovation is in use?" (p.49)

Although technology is an element of the teacher education program at the University of Florida, a true integration of technology into the entire teacher education program has not occurred. There have been discussions and implementation among some programs areas (i.e.: elementary education) of how this would happen but true integration of technology across all teacher education programs is not evident. To facilitate the beginnings of a shared vision among faculty about what integrating technology into the teacher education program means at the University of Florida, an innovation configuration map was started. As part of the interviews, faculty were asked to share their vision of the integration of technology into the teacher education program from three perspectives: an unacceptable implementation, an acceptable implementation, and an ideal implementation.

Because there are numerous programs within the teacher education program at UF, teacher education faculty were asked to express views from the program in which they taught and then to state whether their views would apply to just their program (i.e.: elementary education, early childhood, English education, etc.) or the entire teacher education program. As faculty spoke about the integration of technology into their specific teacher education program, they all noted that their views could be considered for all program areas within the UF teacher education program.

An interesting result of the interviews dealing with the innovation configuration map was two of the perspectives of implementing technology into teacher education programs at UF had similar meanings among the faculty. Those perspectives were the unacceptable implementation and the ideal implementation. Where great variation in ideas occurred was in what an acceptable implementation would look like for this teacher education program. Each area will be briefly discussed and a copy of the first version of the innovation configuration map provided. As more

discussions occur among the faculty, the innovation configuration map will become more detailed and refined.

An Unacceptable Implementation

Participants stated going to either extreme of the technology spectrum—no technology or all technology—was inappropriate. Comments such as "Well, no technology is certainly unacceptable." (Participant 4) and "Using technology for technology's sake is unacceptable. If it is not connected and is not enhancing the teacher education curriculum, it is unacceptable." (Participant 1) were contained in all interviews. Faculty believed it was extremely important to "teach students to use technology in appropriate ways. Students need to think about the learning context and environment when deciding when and how to use technology in teaching. Inappropriate use of resources is unacceptable." (Participant 5)

An Ideal Implementation

Again, teacher education faculty were relatively like-minded in this area. Faculty expressed a desire for technology to provide new and richer context for preservice teachers through the use of simulations. For example, one faculty member expressed the value of simulations which

> allow students to view classrooms with ESL students so all students could have powerful observations. This would also allow for better teacher direction in what to look for in an ESL classroom. These simulations where students could view and then have meaningful discussions about issues surrounding the ESL students would be ideal. (Participant 9)

There was a desire by the teacher education faculty for all preservice students to have field placements and internships where students would see computers used in meaningful ways. "Our preservice students would actually be going into classrooms and seeing kids use computers in meaningful ways—not just using AR [Accelerated Reader]." (Participant 5) In addition, the need for faculty modeling the use of technology in teaching was noted. "They [preservice teachers] need to know that technology is a part of what we do in teaching." (Participant 10)

Faculty also noted that for an ideal implementation of technology into the teacher education programs, the schools would need to be different. "Ideally the public schools would be very different. The public schools and teacher education programs would be liaisoning very closely together. You work on development of preservice teachers and inservice teachers on two levels." (Participant 4)

Finally, faculty expressed issues surrounding the ease of technology use within the teacher education program. Faculty would not have to worry about access, setup, or support issues.

> Technology would be just a part *of* teacher education and not apart *from* teacher education. It would look like the content of the teacher education concept that happened to use technology—not where it looks like technology. Technology

> would be everywhere but it wouldn't be noticed because it was so embedded in the lesson, course, and context. (Participant 1)

An Acceptable Implementation

Attempting to address what was an acceptable implementation of integrating technology into the teacher education program was the most difficult for faculty. Many expressed that it was easy to talk about the extremes—the unacceptable and ideal—but deciding about appropriate "middle ground" was more complex. A common view portrayed was

> I'm not big on acceptable. I want the ideal. Kind of what we're doing now. We have lots of individual efforts to integrate technology into courses and activities but they are not united or connected. I think here at UF we're on a journey to an ideal. (Participant 10)

Therefore, faculty views were sometimes expressed in general terms. Faculty mentioned the critical need for courses related to the integration of technology and the importance of a field experience with technology in the schools. "What would be acceptable across [the teacher education program] would be students getting at least one course with hopefully a field component using technology in meaningful ways with students." (Participant 14) Faculty thought it was important for students to have courses utilizing technology to create more vivid pictures for preservice teachers to consider and understand the complexity and messiness of teaching and where students can learn to use Internet resources to appropriately respond to instructional needs, planning needs, and professional development growth needs.

> Technology should create more interactive context for students. We need to give students more independent power via technology. For example, inside of class, webquests or scavenger hunt kinds of things. Here's a case of what situation a student is in---use the web to discover alternative strategies to meet this child's needs. Yet, conversation is important so students would work together in groups in this kind of activity." (Participant 2)

There were also more extreme differences between faculty responses on what was an acceptable implementation. These ranged from a minimalist approach such as "Incorporating minimal things that don't really change the kinds of experiences that preservice students have." (Participant 15) to a more elaborate approach to the integration of technology into the teacher education program.

> Every teacher educator recognizing that technology is an important facet of 21st century teaching and doing something to promote it within their area. It might be disconnected from what is happening in the schools or in different areas but every instructor uses technology to their benefit. EME 4406 would bring more of what is happening in all the other classes instead of the major focus on technology. True integration. (Participant 4)

The vision of an acceptable implementation of technology into the teacher education program, the stage at which most faculty agreed UF was at, is actually the stage where the most discussion needs to occur. There is a large disconnect between what happens in the different program areas and the expectations of students and faculty within these programs regarding the use of technology in education. Although there are common elements mentioned in interview responses, there is not a common vision of what the classroom would look like where technology is being used and what teachers and students would be doing with the technology as Hall and Hord (2001) suggest.

Innovation Configuration Map for the Integrating Technology into the Teacher Education Program (version 1)

Unacceptable Implementation	**Acceptable Implementation**	**Ideal Implementation**
• Having no technology and having only technology • When technology is disconnected • Considering technology as a means into itself • Attempting to have technology replace real experience in the classroom	(Nearly all participants believed our current implementation is acceptable) • Having a course about technology for students to take with a field component. • To have technology facilitate learning experiences for preservice teachers and facilitate teaching for instructors. • To have courses create more vivid pictures for preservice teachers to consider and understand the complexity and messiness of teaching. • Where students can use Internet resources to appropriately respond to instructional needs, planning needs, and professional development needs.	• Technology is used to provide new and richer contexts for students through simulations. These simulations could: --provide experiences they would not encounter during an internship but which they should be exposed. --allow teacher education faculty to assess preservice teachers on various situations --allow preservice teachers to analyze situations related to planning, instruction, classroom management, and reflection. • Seamless integration into instruction where the instructor does not have to agonize over the technology. • Students in all field placements and internships would see students using computers in meaningful ways. • Faculty would model the use of technology in instruction. • Technology is in the schools and used in meaningful ways.

Implications

The implications for this study will be discussed in three general areas: showing relative advantage, issues for change agents and administrators, and professional development. These areas are where actions can be taken to improve the state of infusing technology into teacher education programs not only at the University of Florida but also in colleges and schools of education throughout the nation.

In a themed issue of *Journal of Technology and Teacher Education*, various evaluation and research studies about PT3 projects were highlighted. The guest editor, Saul Rockman, noted

> The evidence from these research efforts not only demonstrate that school of education faculty can do more than just talk about change, but that they can modify their use of resources, their instructional practice, and even the content of their course to account for technology as a teaching and learning tool, and as a component of the content they are teaching to preservice teachers. (2004, p. iv)

Yet, faculty are not going to change their practices just because they are asked to do so. Faculty must be shown there is a relative advantage to using technology in their teaching. As noted in Strudler's (2003) article, teacher educators that use technology along with educational technologists must provide evidence that technology "does no harm" and can often enhance student learning. As evidenced by many of the comments in this study, numerous faculty "have not been moved" to start using technology in their courses. Roblyer and Knezek (2003) suggest

> Future research must address squarely the question of why teachers should use technology-based methods. The emerging theory base demands that studies look at technologies not as delivery systems, but as components of solutions to educational problems, and that research questions be stated in a way that contributions of methods can be examined and test. (p.63)

Relative advantage must clearly be shown to teacher educators before it becomes a significant and ubiquitous component of teacher education programs. Without this, technology in teacher education programs will continue to be peripheral.

Change agents and administrators still need to work on many of the external factors associated with the integration of technology into teacher education programs. First, if tenure and promotion guidelines do not support or reward faculty for innovative instructional efforts in obtaining tenure and promotion, this will continue to be a hurdle for faculty. As noted earlier this meshes with Rogers (1995) attributes of compatibility of the innovation within the society and institution. Tenure and promotion are important elements of higher education, and innovations that do not mesh with this system will struggle to be infused into the institution. Second, there is the need for rewards and incentives for adopters of innovations. Attempting to integrate technology into teacher education courses should not be an "add-on" for faculty. Providing rewards and incentives are one of Ely's (1976) conditions to create an environment open to change and new innovations. Demands upon faculty are already high. Expecting faculty to continue to take on additional tasks with no perceived benefits will not occur. Rewards could

be equipment, travel money, valuable professional development experiences, and release from other duties to observe, discuss, implement, and make sense of using technology in teaching and learning environments. Funding and staffing are often given as reasons why this cannot occur. However, colleges and schools of education across the nation are notoriously under funded. If the integration of technology into the teacher education curricula is considered to be a valued component of teacher education as indicated by organizations such as NCATE and the US Department of Education, then colleges and schools of education must "put their money where their mouth is" in terms of making this happen within their teacher education programs. Finally, an important issue for administrators and change agents to address is that of the teaching environment. Using technology in teaching and learning environments should not be a struggle. One teacher educator noted when she did not have to "agonize" over the use of technology in her teaching would be when we would be at an acceptable level of teaching environments that support the use of technology. If using technology in teaching causes more problems than productive returns, it is illogical to think teacher educators will use technology in their teaching. Merely putting equipment into a room and not having the means and/or vision to have plans for updating equipment, maintaining the equipment, and providing support to use the equipment is unacceptable.

The final implication of this study is the importance of professional development for teacher education faculty. This does not mean to continue with the endless stream of "how to" workshops. Professional development should be a part of each faculty member's workload. This will allow faculty to grow in many areas—not just in using technology in teaching environments. In addition, it is important the professional development provided address the concerns of faculty. In this study, faculty desired professional development that is consistent, contextual, content-related, and delivered by qualified personnel.

In conclusion, this study provides insight into the reasons faculty do and do not use technology in their teacher education courses. Although these findings are very contextual, many, if not all, can be generalized to other teacher education programs. The call by Robyler & Knezek (2003) and Strudler (2003) to show the relative advantage of technology in teaching should be heeded in order to increase the use of technology in teaching and learning environments at the K12 and higher education levels. The challenge has been made and now the work begins.

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